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Grid Game: Developing a Java/Android version for increased accessibility and usability

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Grid Game

Developing a Java/Android version for increased accessibility and usability



Abstract

- Recreate the LabView based Grid Game in a Java based web-browser / mobile format.
- Implement a Android mobile version.
- Browser/mobile format allows universities, companies, and individuals to use the game without overhead.
- Java is a more popular format than LabView, increasing opportunities for future developers to expand and improve upon our design.
- Thanks to Michael Guryan and IRON (Idaho Regional Optical Networks) for the supporting infrastructure and repositories making the multiplayer functionality possible.



Gameplay

- Main objective of the Grid Game is to keep the frequency of the grid, governed by the Swing Equation, near 60 Hz for the entire duration of the game.
- The player can buy more generators, which generates more power for your grid.
- The player can buy more customers, which increases the load upon the system.
- The battery allows the user to keep their grid balanced even if the power generation and load are not.
- Players can draw power from the battery or add excess power to it.
- Automatic controls will draw and add power to the battery as needed to keep the grid at 60 Hz.
- Time based events that can occur that may either help or harm the player.
- Events include generators breaking down, a large influx of customers to your area, the loss of automatic controls, and more. All of these serve to make the game more challenging and different every round.
- Scoreboard functionality to allow players to see how they rank against others.

Future Possibilities

- Multiplayer functionality with energy trading and cyber attacks
- Clean energy generators
- Dynamic weather based changes to the grid
 - Wind generators produce more on windy days
 - Solar panels are less effective on cloudy days



User Experience

- User interface / user experience for the Grid Game needed to be intuitive
- UI designed to promote an environment for learning and constant player feedback
- Required separate layouts for both desktop (and web) application and the Android app
- Limited screen size on Android devices prevents displaying as much information to the player
- Delegated certain elements of the desktop application UI to a tabular setup in the Android app
- Player still has available all information available to them via the desktop application in a more compact environment

